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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.
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09/588,163 06/06/00 OKAMOTO

1 0941-64328

EXAMINER

024978
GRFER, BURNS & CRAIN
300 S WACKER DR
25TH FLOOR
CHICAGO IL 60606

IM52/0911

RICKMAN H

ART UNIT

PAPER NUMBER

1773

DATE MAILED:

09/11/01

Please find below and/or attached an Office communication concerning this application or proceeding.

Commissioner of Patents and Trademarks

Office Action Summary

Application No.

09/588,923

Applicant(s)

OKAMOTO ET AL.

Examiner

Holly Rickman

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-11 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-11 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on ____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on ____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. ____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 1.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). ____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

Claim Objections

1. Claims 3-4 and 8-9 are objected to because of the following informalities: the cited claims contain improper Markush groups. For instance, claim 8 states, "*selected from a group of Co-based alloys including CoCrTa, CoCrPt,...*" (emphasis added). A proper Markush group is written as "selected from the group consisting of X, Y, or Z" or alternately, "...is X, Y, or Z." Appropriate correction is required.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claims 1-11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Carey et al. (US 6280813) in view of Ounadjela et al. (abstract of J. Appl. Phys., Vol. 70, Issue 10, p. 5877), further in view Akopyan et al. (Izv. Akad. Nauk SSSR, Met. (1976) (3), 210-214), and further in view of Wu et al. (US 6221481). It is noted that a full translation of the Akopyan reference was not available at the time of examination but has been ordered and will be provided as soon as possible.

Carey et al. disclose a magnetic recording medium having a ferromagnetic CoPtCrB layer, a magnetic Co layer, a non-magnetic Ru layer having a thickness of 0.6 nm, a second

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magnetic Co layer, and a top magnetic CoPtCrB layer disposed thereon (Fig. 3, col. 5, lines 26-51). The reference teaches that the "ferromagnetic layer" (no. 14 in Fig. 1) and the "magnetic layer" (no. 12 in Fig. 1) have magnetization directions that are antiparallel (see figures 1, 2a, and 4). The reference is silent with respect to the use of a Ru-M3 non-magnetic layer and the degree of lattice mismatch between this layer and the adjacent magnetic and ferromagnetic layers.

Ounadjela et al. teach that it was known in the art at the time of invention that there is a large lattice mismatch between Ru and Co in Co/Ru hcp superlattices (see first two lines of abstract). Wu et al. teach that a close lattice match is desirable because it allows for smooth epitaxial growth and provides a recording medium with a high signal-to-noise ratio (see abstract).

Akopyan et al. teach several different Ru alloy systems in which the concentrations of the elements are adjusted to obtain different lattice parameters. The additional elements include Ni, Fe, and Co in various combinations.

It would have been obvious to one of ordinary skill in the art at the time of invention to add elements including Ni, Fe, and/or Co to the Ru layer taught by Carey et al. in order to improve lattice matching between the hcp Co and Ru layers thereby producing a recording medium with increased SNR. Furthermore, it would have been obvious to adjust the concentrations of the various elements in the alloys in order to achieve the optimal lattice parameter for optimal matching. Such an optimization would have been obvious since it has been held that discovering an optimum value of a result effective variable involves only routine skill in the art. *In re Boesch*, 617 F.2d 272, 205 USPQ 215 (CCPA 1980).

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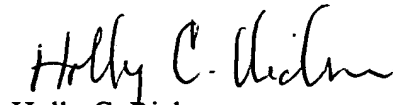
Claims 1-4 and 10 require a lattice mismatch of less than 6%. It is the Examiner's contention that it would have been obvious to optimize this parameter in order to achieve optimal lattice matching and improved magnetic recording properties as a result since lattice matching affects the epitaxial growth and signal-to-noise ratio of a recording medium as disclosed by Wu et al. Such an optimization would have been obvious since it has been held that discovering an optimum value of a result effective variable involves only routine skill in the art. *In re Boesch*, 617 F.2d 272, 205 USPQ 215 (CCPA 1980).

4. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Holly Rickman whose telephone number is (703) 305-2642. The examiner can normally be reached on Monday-Friday 9:30-6:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Paul Thibodeau can be reached on (703) 308-2367. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 872-9310 for regular communications and (703) 872-9311 for After Final communications.

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Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0661.



Holly C. Rickman
Patent Examiner
Art Unit 1773

hcr
September 10, 2001